

What is claimed is:

- [Claim 1]** 1. A fuel system for an internal combustion engine, the fuel system comprising:
- a fuel injector cup for connecting to a fuel rail to distribute fuel; and
 - a fuel injector having one end adapted for insertion into the fuel injector cup,
- wherein the fuel injector cup and the fuel injector include a coupling device that allows axial movement of the fuel injector relative to the fuel injector cup after the fuel injector and fuel injector cup have been assembled while limiting rotational movement therebetween.
- [Claim 2]** 2. The fuel system of claim 1 wherein the coupling device comprises at least one tab on the fuel injector cup and at least one corresponding slot on the fuel injector.
- [Claim 3]** 3. The fuel system of claim 1 wherein the coupling device comprises:
- generally diametrically opposed indentations on the fuel injector cup; and
 - generally diametrically opposed grooves in the fuel injector.
- [Claim 4]** 4. The fuel system of claim 3 wherein each of the grooves in the fuel injector includes a lead-in portion extending to a top surface of the fuel injector, a helical portion, and an axial locking portion.
- [Claim 5]** 5. The fuel system of claim 4 wherein the axial locking portion of each groove is deeper than the helical portion.
- [Claim 6]** 6. The fuel system of claim 3 wherein each of the grooves in the fuel injector includes an axial lead-in portion extending to a top surface of the fuel injector and an axial locking portion, the lead-in portion and locking portion being separated by a protrusion in a bottom surface of the groove.
- [Claim 7]** 7. The fuel system of claim 3 wherein each of the grooves in the fuel injector comprises an axial groove that terminates below a top surface of the fuel injector.

[Claim 8] 8. The fuel system of claim 3 wherein the fuel injector includes a frustoconical top portion.

[Claim 9] 9. The fuel system of claim 3 wherein the indentations are asymmetrically shaped.

[Claim 10] 10. The fuel system of claim 1 further comprising an upper seal positioned to form a fuel tight seal between the fuel injector and the fuel injector cup, wherein the coupling device is disposed closer to a top surface of the fuel injector than the upper seal.

[Claim 11] 11. A fuel system for a multiple cylinder internal combustion engine, the fuel system comprising:

a fuel injector cup adapted for connecting to a fuel rail for distributing fuel, the fuel injector cup including at least one retention tab extending radially inward; and

a fuel injector having a top portion insertable into the fuel injector cup, the top portion including at least one groove that cooperates with the at least one retention tab to limit rotational movement while allowing axial movement between the fuel injector cup and the fuel injector after assembly.

[Claim 12] 12. The fuel system of claim 11 wherein the at least one groove comprises generally diametrically opposed axial grooves.

[Claim 13] 13. The fuel system of claim 11 wherein the injector includes opposing grooves having an axial lead-in portion extending to a top surface and a helical portion connecting the lead-in portion to an axial locking portion.

[Claim 14] 14. The fuel system of claim 13 wherein the axial locking portion is deeper than the helical portion.

[Claim 15] 15. The fuel system of claim 11 wherein the top portion of the injector includes a frustoconical portion and wherein the at least one groove comprises an axial groove terminating below the frustoconical portion.

[Claim 16] 16. The fuel system of claim 11 wherein the at least one groove comprises an axial groove extending to a top surface of the fuel injector and includes a

lead-in portion and locking portion separated by a protrusion in a bottom surface of the groove.

[Claim 17] 17. The fuel system of claim 11 wherein the at least one retention tab includes asymmetrically sized opposing retention tabs and wherein the at least one groove includes corresponding asymmetrically sized opposing grooves to uniquely orient the fuel injector within the fuel injector cup.

[Claim 18] 18. A method comprising:

aligning a coupling device associated with a fuel injector cup with a coupling device associated with a fuel injector; and

engaging the coupling devices until reaching a locking position that allows relative axial movement but limits rotational movement between the fuel injector cup and the fuel injector.

[Claim 19] 19. The method of claim 18 wherein the coupling device associated with the fuel injector cup includes opposing indentations and the coupling device associated with the fuel injector includes corresponding opposing axial grooves.

[Claim 20] 20. The method of claim 18 wherein the step of engaging the coupling devices includes rotating the fuel injector relative to the fuel injector cup.